

Appendix D — Quarry Sites, Haul Roads, Railroads, and Cap Description

The need for mineral resources in support of Hanford Site remediation will likely require development or enlargement of quarries. One possible remediation technology that could be selected to isolate harmful substances from humans and the environment is construction of surface caps over the waste sites. Surface caps generally consist of successive layers of materials such as basalt riprap, sand, gravel, geotextile membranes, and asphalt. Materials required for cap construction could be obtained from sources located on or off the Hanford Site. Appendix D provides a description of a reference cap design (Section D.1) and identifies potential sources of materials required for cap construction (Section D.2). The reference cap provides a conservative estimate of materials that could be required for cap construction. Other cap designs that would require less material would be evaluated during the remediation process for each specific waste site. Quarries located on the Hanford Site would be constructed in areas with a designated land use that accommodates mining activities.

Two prospective quarries have been identified as potential sources of materials for construction of surface caps over waste sites: McGee Ranch and Pit 30. McGee Ranch would serve as a source of fine materials, and Pit 30 would provide coarser aggregates.

In addition to the above quarries, several potential sources of basalt that may be required for barrier construction have been tentatively identified and evaluated in an engineering study (BHI 1995). The basalt quarry would provide material for riprap and possibly for asphalt and asphalt-base layers of the reference barrier. Ten locations on or near the Hanford Site have been evaluated as candidate basalt quarry sites. Evaluations were based on qualifying criteria (i.e., proximity to the 200 Areas on the Hanford Site, basalt availability, suitability of basalt, and threatened and endangered species impacts) and engineering criteria (i.e., haul distance, safety, expansion potential, and land reclamation potential). Other important factors used in determining the suitability of a site for quarry development are the significant cultural, archaeological, and historical resources that might be present.

Cultural resource surveys indicate that the most favorable sites for basalt quarry development from an engineering perspective are the least favorable for development from a cultural resources perspective. The most favorable sites from an engineering perspective exhibit features valued by American Indian tribes for traditional cultural and religious reasons. Sites that are less favorable for quarry development from an engineering perspective typically consist of near-surface basalt sources that do not have the commanding view of the surrounding terrain that is valued by tribal members for traditional cultural and religious uses. Factors other than cultural resources (e.g., excavation requirements, transportation cost, and reclamation potential) make these near-surface basalt sources less desirable from an engineering perspective.

D.1 Reference Cap Design

To estimate the quantity of materials required for cap construction, a conservative reference cap design was used in the analysis. For additional conservatism, capping was assumed to be the selected remedy for most Hanford waste sites. Other cap designs involving less material and, therefore, having lower construction and environmental costs, would be considered in the evaluation of remediation technologies for use at each specific waste site. The reference cap design provides the most conservative estimates of materials that would be required.

1 The reference cap design, commonly referred to as the Hanford Cap or Hanford Barrier,
2 is a composite cap intended to protect waste sites from human intrusion, burrowing animals,
3 root penetration, and water infiltration. This reference cap was designed specifically for
4 conditions at the Hanford Site (i.e., a desert environment). The Hanford Cap consists of ten
5 layers divided into three zones (from top to bottom): a water retention and evapotranspiration
6 zone, a capillary break and biotic intrusion zone, and a low-permeability moisture barrier.
7

8 The water retention and evapotranspiration zone would consist of a 100-cm (39-in.)-thick
9 layer of silt and pea gravel over a 100-cm (39-in.)-thick layer of silt. The top layer of silt and pea
10 gravel would be seeded with various grasses. The silt and pea gravel layer would provide a
11 growing medium for vegetation as well as some resistance to wind and water erosion. Water
12 from precipitation would be held in this 200-cm (78-in.)-thick zone. The plants established on
13 top of this zone would extract water from the soil and, through evapotranspiration, return
14 moisture to the atmosphere.
15

16 The capillary break and biotic intrusion zone would be constructed of coarser materials
17 than the water retention zone and would consist of a sand filter, a gravel filter, and a layer of
18 crushed basalt. The capillary break would minimize water infiltration because moisture would
19 not flow into the larger gaps found in the coarser material until water pressure in the overlying
20 zone increased to nearly atmospheric pressure. The upper, fine-textured water retention zone
21 would need to be nearly saturated before moisture would break through into the underlying
22 coarse material. A geotextile filter would be located at the interface between the water retention
23 zone and the capillary break. The geotextile filter would impede downward migration of fine-soil
24 into the underlying sand filter, thereby maintaining the textural contrast that creates the capillary
25 break. The lack of moisture in the basalt layer would discourage root penetration. The larger
26 materials, particularly the crushed basalt, would provide a barrier to burrowing animals, root
27 penetration, and inadvertent human intrusion.
28

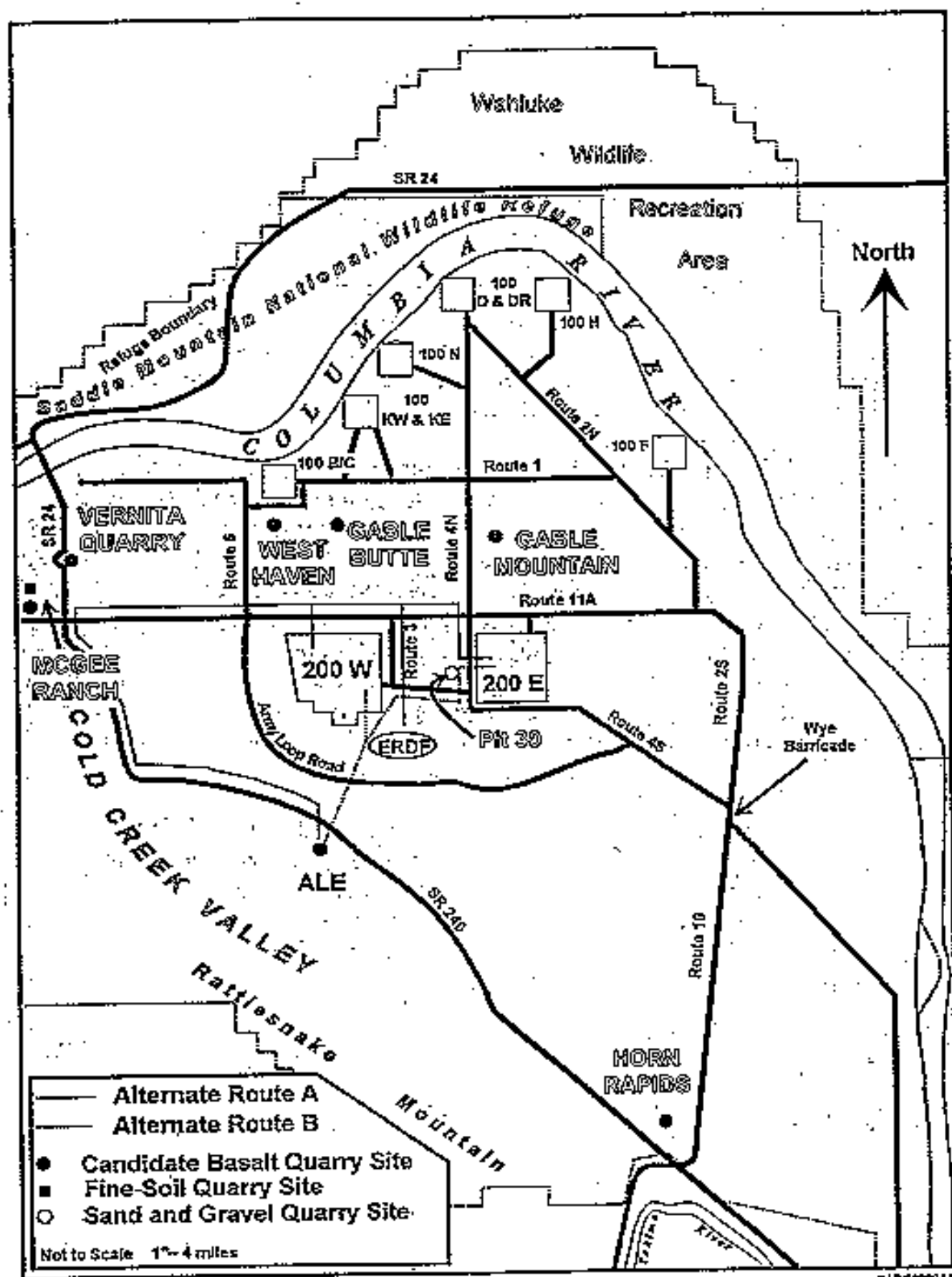
29 The low permeability moisture barrier would consist of a 30-cm (11.7-in.) crushed rock
30 or gravel drainage layer, a 10-cm (3.9-in.) asphaltic concrete layer, and a base course. This
31 zone would collect moisture that penetrated the upper layers and divert the moisture away from
32 the buried wastes that underlie this last zone. The low permeability moisture barrier would be
33 situated on top of the existing interim soil cover.
34
35

36 **D.2 Quarry Sites**

37

38 The following sites have been identified as preferred sources of cap materials (see
39 Figure D-1) based on engineering studies and other available information (BHI 1995;
40 Lindberg 1994; Skelly 1992). Final selection of quarry sites would depend on the amounts and
41 types of materials required, as determined on a site-specific basis. For example, use of a
42 modified *Resource Conservation and Recovery Act of 1976* (RCRA) C cap would require
43 minimal use of basalt and could make development of a basalt quarry unnecessary. Quarries
44 would be developed only in areas with future land-use designations consistent with mining
45 activities. The following sections discuss potential quarry sites and the land-use designations
46 for those sites under each alternative. Upon approval of the Record of Decision for the *Hanford* |
47 *Comprehensive Land-Use Plan Environmental Impact Statement* (HCP EIS), development of a |
48 quarry in an area without a land-use designation consistent with mining activities would require
49 changing the land-use designation for that area through the *National Environmental Policy Act of*
50 *1969* (NEPA) process.
51

Figure D-1. Preferred Sources of Cap Materials.



D.2.1 McGee Ranch

McGee Ranch has been identified as the preferred quarry site for fine-grained soils potentially used in construction of caps for closure of waste sites at the Hanford Site. Fine-grained soils might be used as topsoil for the cap.

McGee Ranch is located near the west boundary of the Hanford Site, north of State Highway 24, west of State Highway 240, and south of the Columbia River. The site encompasses 873 ha (2,182 ac) and has approximately 36.1 million m³ (47.3 million yd³) of proven reserves of fine-textured soils (Lindberg 1994; Skelly 1992).

The Hanford Cultural Resources Laboratory conducted an archaeological survey of the McGee Ranch (PNL 1992) and determined that historic and prehistoric cultural resources are associated with this site. Prior to initiating activities at the McGee Ranch, requests for determination of eligibility, findings of effect and adverse effect, and plans for mitigating adverse impacts of the proposed action would be prepared and submitted to the appropriate Federal, state, and tribal interests.

A survey for sensitive plant and animal species was conducted at the McGee Ranch site in 1991 (Sonnichsen 1991). No threatened or endangered species were encountered. Subsequent surveys of the site indicated the presence of two Washington State plant species of concern, the crouching milkvetch and scilla onion (BHI 1995b). Two Washington State wildlife species of concern, the loggerhead shrike and the sage sparrow, were observed at the McGee Ranch site (BHI 1995). Swainson's hawk potentially could be associated with the McGee Ranch site. Assuming total use of the site, operation of the McGee Ranch quarry would eradicate 652 ha (1,629 ac) of shrub-steppe habitat. This area serves as a wildlife movement corridor between large blocks of shrub-steppe habitat on the Hanford Site and the Yakima Training Center, located northwest of Hanford. Prior to initiating the development of the site, the State of Washington and the U.S. Fish and Wildlife Service (USFWS) would be consulted regarding potential impacts to sensitive species.

McGee Ranch is located in an area designated for Conservation (Mining) under Alternative Three. Development of a quarry site at McGee Ranch would be consistent with the land-use designation under this alternative. The area is designated for Preservation under the Preferred Alternative and Alternatives One, Two, and Four; and this designation would preclude use of McGee Ranch as a source of materials for construction of caps. McGee Ranch could also be developed as a source of materials under the No-Action Alternative.

D.2.2 Pit 30

Pit 30 is an existing quarry site located immediately adjacent to the west side of the 200 East Area. Pit 30 could provide coarse sands and gravels required for cap construction. Pit 30 is a disturbed site associated with pre-Hanford farming activity. Development and expansion of Pit 30 would potentially impact 172 ha (426 ac), including the existing 49-ha (120-ac) pit. A formal calculation of total reserves of coarse aggregate material is not available, but reserves at Pit 30 are estimated to be approximately 15.3 million m³ (20 million yd³) of material. Pit 30 would provide aggregate to be used as graded filter material in the reference cap and other graded caps. Expansion of the existing pit would be necessary to provide sufficient quantities of this material. Full use of the site would eradicate approximately 138 ha (345 ac) of shrub-steppe habitat. Cultural resource and sensitive species surveys have not been conducted for Pit 30 and would be required prior to excavation. Preliminary information received from the USFWS and the State of Washington indicate that there are no sensitive species associated with this site. Completion of these surveys and consultation with the State of Washington and the USFWS would be required prior to initiating activity.

Pit 30 is located in an area designated for Industrial-Exclusive use under all alternatives. Obtaining materials for construction of caps over waste sites would be consistent with this land-use designation.

D.2.3 Potential Basalt Quarry Sites

Candidate quarry sites have been evaluated on the basis of qualifying criteria and engineering criteria (BHI 1995). A broad range of possible quarry sites, including seven onsite candidate quarries and three offsite privately operated quarries, were addressed. Candidate quarries included exposed basalt outcrops and basalt sources at or slightly below grade. Sites evaluated as potential basalt quarries were Vernita Quarry, McGee Ranch, the Fitzner/Eberhardt Arid Lands Ecology Reserve (ALE Reserve) Site, Horn Rapids Site, Gable Mountain Site, Gable Butte Site, West Haven Site, Section 9 Quarry, DeAtley Quarry, and Mahaffey Quarry. (The last three sites are privately owned and operated off the Hanford Site.)

Factors considered in the evaluation were categorized into two groups: (1) environmental, safety, and security factors; and (2) engineering and economic factors. Qualifying criteria included proximity to the 200 Areas on the Hanford Site (Central Plateau), basalt availability, suitability of basalt, and threatened and endangered species impacts. Engineering criteria included haul distance, safety, expansion potential, and land reclamation. Detailed descriptions of these criteria and evaluations are provided in the *Site Evaluation Report for Candidate Basalt Quarry Sites* (BHI 1995).

Historical, archaeological, and cultural resource impacts were not used as qualifying criteria because to date, only a portion of each candidate Hanford quarry has been surveyed and the database is incomplete. These resources would be fully assessed, evaluated, and mitigated, if necessary, prior to beginning any quarry operations. Mitigation would most likely be undertaken in accordance with a Memorandum of Agreement developed in coordination with the U.S. Department of Energy, Richland Operations Office (RL), the State Historic Preservation Office, and Tribal governments.

Development of a surface (or near-surface) basalt site would be comparable to a typical open-pit mine. A site occupying approximately 200 ha (500 ac) would need to be developed to a depth of approximately 25 m (80 ft) to satisfy the potential materials need.

Ecological surveys for threatened or endangered species were conducted at each Hanford Site candidate quarry. No Federal or state threatened or endangered species were observed at these sites, although several Federal and state species of concern were observed. Ecological surveys were not conducted at the three privately operated commercial quarries.

D.2.3.1 Vernita Quarry. Vernita Quarry is located off the east side of State Highway 24 near Vernita Bridge and has been identified as a suitable source to supply riprap required for use in constructing protective surface caps at the Hanford Site. NEPA documentation, including a survey for threatened or endangered species and a cultural resource survey, was prepared to support removing a small quantity of basalt from this quarry, and approximately 10,700 m³ (14,000 yd³) of riprap was removed in March 1994. This basalt was used to construct a prototype Reference (Hanford) Cap over the B-57 crib in the 200-BP-1 Operable Unit. Vernita Quarry could be developed by expanding the existing quarry or by developing a new quarry in the vicinity.

The quarry is located in an extensive basalt outcrop and a considerable volume of basalt exists outside of the area identified for quarry development. Initially, a 45-ha (110-ac) parcel would be developed. This parcel could yield 11.9 million m³ (15.6 million yd³) of loose riprap. Additional basalt could be obtained at this quarry by deeper excavation or by extending the quarry deeper into the basalt bench. Additional overburden per unit area might be encountered on parts

1 of this outcrop, if the quarry were to be expanded beyond the identified boundaries. The potential
2 volume of useable basalt makes expansion of this site feasible, and the Vernita Quarry Site
3 could supply a sufficient quantity of basalt for cap construction.

4
5 Vernita Quarry is located in an exposed bench that could be reclaimed fairly successfully
6 from a physical and topographic perspective. The bench would be translocated into the original
7 outcrop and, when the quarry operations were complete, an exposed bench would remain. The
8 approach to the new bench could be graded to provide a natural transition from the surrounding
9 terrain. Revegetation would be used to further enhance the transition between undisturbed and
10 disturbed areas.

11
12 Two Washington State plant species of concern, the crouching milkvetch and the
13 stalked-pod milkvetch, were observed during a survey at the Vernita Quarry Site. A list of all
14 flora and fauna species observed at this site and other potential sites during the ecological
15 surveys is included as Appendix C in the *Site Evaluation Report for Candidate Basalt Quarry*
16 *Sites* (BHI 1995).

17
18 Vernita Quarry is located in an area designated for Conservation (Mining) in the Preferred
19 Alternative, and Conservation (Mining) in Alternative Three. Development of a quarry at this site
20 would be consistent with these land-use designations. Vernita Quarry is located in an area
21 designated for Preservation under Alternatives One, Two, and Four; and development of the
22 quarry would not be consistent with this land-use designation. Vernita Quarry could be
23 expanded under the No-Action Alternative.

24
25 **D.2.3.2 McGee Ranch.** A near-surface basalt source exists on the interior north portion of the
26 McGee Ranch site, northwest of the McGee well. Another portion of McGee Ranch is a potential
27 quarry site for fine-textured soils required for cap construction and the same infrastructure could
28 support both the fine-soil quarry and the basalt quarry. Basalt characteristics for this site are not
29 well known because surfaces or benches are not exposed. The formation exists as a knoll with
30 approximately 15 to 30 m (50 to 100 ft) of vertical relief. The thickness of the overburden is not
31 known. The most likely scenario for developing a quarry at this site would be to begin mining the
32 east end of the ridge. Quarry development would proceed to the west in blocks that span the
33 width of the formation, while maintaining grade above the 274 m (900 ft) contour level. If
34 additional basalt was required, excavation would proceed below this contour level. This potential
35 quarry site consists of a 47 ha (116 ac) parcel. Excavation of the site to the 274 m (900 ft)
36 contour level would yield 15.3 million m³ (20 million yd³) of loose riprap.

37
38 The basalt knoll at McGee Ranch would be developed similarly to an exposed outcrop.
39 The reclaimed landscape would not blend with the surrounding landscape to the same degree
40 as the Vernita Quarry Site. The knoll has several drainages running lengthwise on either side,
41 which would be eliminated by removal of the basalt formation during quarry operations. A pit
42 would be created if the formation were mined below the grade of the surrounding landscape to
43 provide additional basalt materials. A revegetation program would help the quarry area partially
44 blend with the surrounding landscape and would camouflage the quarry.

45
46 Two Washington State plant species of concern (the crouching milkvetch and scilla
47 onion) and two Washington State wildlife species of concern (the loggerhead shrike and the
48 sage sparrow) were observed at the McGee Ranch site.

49
50 The McGee Ranch site is located in an area designated for Conservation (Mining) in
51 Alternative Three. Development of a quarry at this site would be consistent with this land-use
52 designation. The proposed quarry site is located in an area designated for Preservation under
53 the Preferred Alternative and Alternatives One, Two, and Four. Development of the quarry would
54 not be consistent with this land-use designation. McGee Ranch could be developed under the
55 No-Action Alternative.

D.2.3.3 The Fitzner/Eberhardt Arid Lands Ecology Reserve (ALE Reserve). The Fitzner/Eberhardt Arid Lands Ecology Reserve (ALE Reserve) consists of near-surface basalt located approximately 300 m (1,000 ft) south of State Highway 240 near Gate 116. This site would be developed similar to an open-pit surface mine, with adequate buffer zones surrounding the excavation to maintain safe side slopes.

The near-surface portion of the basalt formation covers a fairly limited area compared to the other sites. The quantity of basalt at this site is large and expansion could probably be accommodated through deeper excavation. However, further geologic surveys would need to be conducted to verify the extent of this formation and the depth of overburden and weak flow-top material, and to determine if a sufficient quantity of basalt could be obtained from the ALE Reserve.

One Washington State plant species of concern (the stalked-pod milkvetch) and two Washington State bird species of concern (the grasshopper sparrow and sage sparrow) were observed at the ALE Reserve.

The ALE Reserve is located within an ecology reserve that, for the most part, has remained untouched by large development activities and has been set aside for ecological preservation and research. The proximity of a quarry to the ALE Reserve might result in avoidance behavior or other disturbance by sensitive species and animals (e.g., mule deer and elk). A large-scale basalt quarry does not fit historical or current use designations for the ALE Reserve.

The ALE Reserve is located in an area designated for Conservation (Mining) in the Preferred Alternative and Alternatives Three and Four. Development of a quarry at this site would be consistent with this land-use designation. The ALE Reserve is located in an area designated for Preservation under Alternatives One and Two. Development of the quarry would be consistent with this land-use designation. Development of the quarry would not be consistent with current management practices and would be a nonconforming use under the No-Action Alternative.

D.2.3.4 Horn Rapids Site. A basalt outcrop and potential quarry area exists 900 m (3,000 ft) north of the Horn Rapids Dam. Characteristics of this site are not well known because few basalt benches are exposed. The flow top is relatively flat at the 152-m (500-ft) contour with abundant scattered basalt rocks in places. Some vertical relief exists near the south end and near the center on the west side of the outcrop, and these two locations might provide the most suitable locations to begin quarry operations. Initial quarry development would probably involve an 84-ha (207-ac) parcel.

The Horn Rapids site could be developed in a manner similar to development of the basalt formation at Vernita. A well-developed and exposed bench is not present at the Horn Rapids site, but vertical relief at the south end would enable development of a 9- to 12-m (30- to 40-ft) bench.

The near-surface source at the Horn Rapids site is fairly extensive and could accommodate future expansion. Further geologic surveys would need to be conducted to verify the extent of this formation and to determine if a sufficient quantity of basalt could be obtained from the Horn Rapids site.

One Washington State wildlife species of concern (two pairs of long-billed curlew) was observed at the Horn Rapids site.

The Horn Rapids site is located in an area designated for Research and Development in the Preferred Alternative and Alternative Three. Development of a quarry at this site would not

be consistent with this land-use designation. The Horn Rapids site is located in an area designated for Preservation under Alternatives One, Two, and Four. Development of the quarry would not be consistent with this land-use designation. The site would be available for development under the No-Action Alternative.

D.2.3.5 Gable Mountain Site. Gable Mountain is a prominent geologic feature north of Route 11A and north-to-northeast of the 200 East Area. A small quarry already exists at this site, and observation of exposed basalt indicates that a suitable quality of basalt exists throughout the west end of Gable Mountain. The existing quarry on the west end of Gable Mountain has the capacity to supply all basalt needs at the Hanford Site. The quarry would be expanded by advancing eastward into the mountain. A considerable quantity of naturally occurring talus slope material exists at Gable Mountain and could provide many thousands of cubic meters of riprap. Also, several large piles (thousands of cubic meters) of human-made riprap exist in the old quarry site. Development of a quarry at the Gable Mountain site would begin at the far west end of the mountain and proceed east.

Gable Mountain contains extensive exposed basalt benches that would be well suited for quarry development. An open-pit mine would not be developed unless restrictions were placed on quarry expansion. Land reclamation at the site would be capable of blending the quarry with the surrounding landscape.

Gable Mountain has considerable cultural resource value as a sacred site for American Indian tribes. Development of a quarry at Gable Mountain would adversely impact a cultural resource valued by American Indians and would represent an irreversible and irretrievable (I&I) commitment of this cultural resource.

One Washington State plant species of concern (the stalked-pod milkvetch) and two state wildlife species of concern (the loggerhead shrike and the prairie falcon) were observed at the Gable Mountain site.

Gable Mountain is located in an area designated for Preservation in the Preferred Alternative and Alternatives One, Two, and Four. Development of a quarry at this site would not be consistent with this land-use designation. Gable Mountain is located in an area designated for Conservation (Mining) under Alternative Three, and development of the quarry would be consistent with this land-use designation. A quarry could also be developed under the No-Action Alternative.

D.2.3.6 Gable Butte Site. Gable Butte is a prominent geologic feature north of Route 11A and north of the 200 West Area. The quarry site would consist of outcrops located west of the railroad grade at Gable Butte, immediately west of Gable Butte proper. A considerable quantity of naturally occurring talus slope material is associated with these outcrops and thousands of cubic meters of riprap could possibly be obtained from this material. Development of a quarry at the Gable Butte Site would begin at the south end of the area of interest. Sufficient space is available for stockpiling material and for parking equipment in the southern portion of this area. The outcrops that would be quarried range in elevation from about 152 m (500 ft) to 182 m (600 ft).

Gable Butte and associated outcrops have the capacity to meet all basalt needs at the Hanford Site. The outcrops immediately west of Gable Butte provide excellent opportunities for quarry expansion. Talus slopes at the base of the outcrops could supply significant quantities of basalt that is already broken into riprap-sized material that may be suitable for cap construction.

Gable Butte has cultural resource value as a sacred site for American Indian tribes. Development of a quarry at Gable Butte would impact a cultural resource valued by American Indians and would represent an I&I commitment of this cultural resource.

Two Washington State plant species of concern (the stalked-pod milkvetch and crouching milkvetch) and one Washington State wildlife species of concern (the loggerhead shrike) were observed at the Gable Butte site.

Gable Butte is located in an area designated for Preservation in the Preferred Alternative and Alternatives One, Two, and Four. Development of a quarry at this site would not be consistent with this land-use designation. Gable Butte is located in an area designated for Conservation (Mining) under Alternative Three, and development of the quarry would be consistent with this land-use designation. A Gable Butte quarry could also be developed under the No-Action Alternative.

D.2.3.7 West Haven Site. The West Haven site consists of a single large basalt outcrop located immediately east of Route 6 and west of Gable Butte. A considerable quantity of naturally occurring talus slope material exists at this site and could provide many thousands of cubic meters of riprap. The West Haven site and nearby outcrops have the capacity to supply sufficient quantities of basalt material for cap construction. Development of a quarry at the West Haven site would begin at the south end of the area of interest. Sufficient space is available for stockpiling material and for parking equipment in the southern portion of this area.

West Haven contains extensive exposed basalt benches that would be well suited for quarry development. An open-pit mine would not be developed unless restrictions were placed on quarry expansion. Land reclamation at the site would be capable of blending the quarry with the surrounding landscape.

Two Washington State plant species of concern (the crouching milkvetch and the stalked-pod milkvetch) were observed at the West Haven site.

The West Haven Site is located in an area designated for Conservation (Mining) in the Preferred Alternative and Conservation (Mining) in Alternative Three. Development of a quarry at this site would be consistent with these land-use designations. The West Haven site is located in an area designated for Preservation under Alternatives One, Two, and Four; and development of the quarry would not be consistent with this land-use designation. The site could also be developed under the No-Action Alternative.

D.2.3.8 Section 9 Quarry. The Section 9 quarry is a privately owned quarry located north of Wanapum Dam. This quarry has considerable quantities of basalt in-place that could be blasted and crushed to produce the desired riprap. Quarry development would be the responsibility of the quarry operator. The status of threatened or endangered species and cultural resources at this site is not known.

The Section 9 quarry and surrounding basalt formation could easily supply the volume estimate of 15.3 million m³ (20 million yd³) of riprap used in evaluating sites (BHI 1995). Bank reserve volumes at this quarry site are expected to be sufficient to meet the requirement for basalt materials used in cap construction.

D.2.3.9 DeAtley Quarry. The DeAtley Quarry is a privately owned quarry located on the old Highway 12, about 6.7 km (4.2 mi) east of Benton City, Washington. Development of the quarry would be the responsibility of the quarry operator. The status of threatened or endangered species and cultural resources at this site is not known.

The DeAtley Quarry and surrounding basalt formation could supply an estimated basalt bank volume of 7.6 million m³ (10 million yd³) from this 24-ha (60-ac) site (BHI 1995). This translates to approximately 11.6 million m³ (15.2 million yd³) of loose riprap. The DeAtley Quarry might not have sufficient reserves to supply the quantity of basalt required for construction of all caps on the Hanford Site.

1 **D.2.3.10 Mahaffey Quarry.** The Mahaffey Quarry is privately owned and located on Clodfelter
2 Road about 5.5 km (3.4 mi) from the intersection of Clodfelter Road and Clearwater Avenue in
3 Kennewick, Washington. Quarry development would be the responsibility of the quarry operator.
4 The status of threatened or endangered species and cultural resources at this site is not known.
5

6 An area of 5.7 ha (14 ac) of the 16-ha (40-ac) quarry site is currently permitted for
7 operations at the Mahaffey Quarry. Total reserve estimates at this site are not known. Much of
8 the basalt is subsurface, with as much as 2.4 m (8 ft) of topsoil in places. The reserve estimate
9 for this site is assumed to be similar to that of the 24-ha (60-ac) DeAtley Quarry. The Mahaffey
10 Quarry may not have sufficient reserves to supply the quantity of basalt required for construction
11 of all caps on the Hanford Site.
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13
14